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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,701	04/17/2001	Xiaodong Li	005158.P007X	9152

29053 7590 06/02/2005

DALLAS OFFICE OF FULBRIGHT & JAWORSKI L.L.P.
2200 ROSS AVENUE
SUITE 2800
DALLAS, TX 75201-2784

EXAMINER

CONTEE, JOY KIMBERLY

ART UNIT	PAPER NUMBER
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2686

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/837,701	Applicant(s) LI ET AL.	
	Examiner Joy K Contee	Art Unit 2686	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 April 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 and 48-50 is/are allowed.
- 6) ☒ Claim(s) 11-25 and 34-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. After reconsidering the claim language found independent claims 11 and 34, which were previously provisionally rejected under the judicially created doctrine of obviousness-type double patenting, examiner has found newly discovered references to Heath, Jr. , U.S. Patent No. 2005/0025099 and Hakkinen et al., U.S. Patent No. 6,282,185, which have been applied to claims 11-18,19-25,34-47. See detailed rejection below.
2. The terminal disclaimer filed on 4/8/05 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Patent Application Pub.No. 2003/0169681 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11-18 and 34-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baum et al. (Baum), U.S. Patent No. 5,867,478, previously used, in view of Heath, Jr. et al (Heath, Jr), U.S. Patent 2005/0025099.

Regarding claims 11 and 34, Baum discloses an apparatus comprising: a subscriber (col. 5, lines 63-66); a base station including a subcarrier allocator (i.e., inherent to SC-OFDM) and a variation detector (reads on SF-OFDM receiver unit in base unit), the base station being communicatively coupled to the subscriber (col. 5, lines 37-61 and col. 7, lines 40-43 and col. 23, lines 42-47); a variation detector to detect channel variation, wherein the subcarrier allocator allocates either one or more diversity clusters of subcarriers (col. 17, lines 8-22) or one or more coherence clusters of subcarriers to the subscriber based on results of channel variation detection by the variation detector (col. 3, lines 15-26 and col. 5, lines 37-61).

Baum does not explicitly disclose determining whether a subscriber is mobile or fixed and allocating diversity and coherence clusters accordingly.

In a similar field of endeavor, Heath Jr. et al. discloses determining whether a subscriber is mobile or fixed wherein the base station may respond by changing a channel, p. 18 [0136 & 0138 & 0139].

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Baum to include the determining whether a mobile is fixed or mobile, since Baum detects channel variation which maybe determined based on the mobility of the subscriber.

Regarding claims 12, 13, 14, 35 and 36 Baum and Heath, Jr. discloses the apparatus defined in claims 11 and 34 wherein the variation detector measures channel variation periodically (i.e., monitors symbols over a period of time) for each cluster (col. 14, lines 24-40)

Regarding claims 15 and 37, Baum discloses the apparatus defined in claims 11 and 34 wherein the variation detector measures SINR values periodically for each cluster (col. 14, lines 24-40).

Regarding claims 16 and 38, Baum discloses the apparatus defined in claims 11 and 34 wherein the variation detector measures a power difference (i.e., reads on delay) between pilot symbols for each cluster and average the difference (i.e., reads on phase difference due to symbol timing phase) over a window of time slots (col. 19, lines 3-26).

Regarding claims 17 and 39, Baum discloses the apparatus defined in claims 11 and 34, wherein the window of time slots comprises a moving window of time slots (col. 19, lines 3-26).

Regarding claims 18 and 40, Baum discloses the apparatus defined in claims 11 and 34 wherein the window of time slots comprises four time slots (col. 14, lines 13-18).

5. Claims 19-25 and 41-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Baum and Heath, Jr., in further view of Hakkinen et al. (Hakkinen), U.S. Patent No. 6,282,285.

Regarding claims 19 and 41, the combination of Baum and Heath, Jr discloses the method defined in claims 11 and 34, respectively, but fails to disclose, further comprising transmitting information using one diversity cluster while performing frequency hopping.

In a similar field of endeavor, Hakkinen discloses transmitting information using one diversity cluster while performing frequency hopping (col. 4, lines 65-67).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include transmitting information using one diversity cluster while performing frequency hopping for the purpose of allowing the signals to be separated from one another upon reception.

Regarding claims 20 and 42, the combination of Baum and Heath, Jr. discloses the method defined in claims 11 and 34 but fails to explicitly disclose wherein using one diversity cluster includes channel coding across subcarriers of the one diversity cluster.

In a similar field of endeavor, Hakkinen discloses wherein using one diversity cluster includes channel coding across subcarriers of the one diversity cluster (col. 4, lines 36-39).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include wherein using one diversity cluster includes channel coding across subcarriers of the one diversity cluster for purpose of allowing subcarriers to serve to reduce the number of signals for multiuser detection.

Regarding claims 21 and 42, the combination of Baum and Heath, Jr. discloses the method defined in claims 11 and 34 further comprising transmitting codewords in which each codeword contains bits transmitted from multiple subcarriers and with difference bits between codewords being distributed among multiple subcarriers.

Hakkinen further discloses inherently transmitting codewords in which each codeword contains bits transmitted from multiple subcarriers and with difference bits between codewords being distributed among multiple subcarriers (col. 3, lines 29-59).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include transmitting codewords in which each codeword contains bits transmitted from multiple subcarriers and with difference bits between codewords being distributed among multiple subcarriers for the purpose of filtering the signals of multiple subcarriers.

Regarding claims 22 and 43, the combination of Baum and Heath, Jr. discloses the method defined in claims 11 and 34 wherein subcarriers of one coherence cluster are within the coherent bandwidth of a channel between a base station and a subscriber.

Hakkinen further discloses wherein subcarriers of one coherence cluster are within the coherent bandwidth of a channel between a base station and a subscriber (col. 4, line 49 to col. 5, line 22).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include wherein subcarriers of one coherence cluster are within the coherent bandwidth of a channel between a base station and a subscriber for the purpose of evenly utilizing entire frequency band.

Regarding claims 23 and 44, the combination of Baum and Heath, Jr. discloses the method defined in claims 11 and 34 further comprising updating allocation of clusters to the subscriber.

Hakkinen further discloses inherently updating allocation of clusters to the subscriber (col. 5, lines 10-49).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include updating allocation of clusters to the subscriber for the purpose of allowing for frequency hopping.

Regarding claims 24 and 45, the combination of Baum and Heath, Jr. discloses the method defined in claim 11 further comprising reconfiguring cluster classification when population of mobile and fixed subscribers in a cell changes.

Hakkinen further discloses inherently reconfiguring cluster classification when population of mobile and fixed subscribers in a cell changes (col. 5, lines 6-49).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include reconfiguring cluster classification when population of mobile and fixed subscribers in a cell changes for the purpose of allowing subcarrier frequency hopping one carrier at a time such that collisions are avoided.

Regarding claims 25 and 46, the combination of Baum and Heath, Jr. discloses the method defined in claim 11 wherein the at least one diversity cluster is configured to reduce an effect of inter-cell interference.

Hakkinen further discloses wherein the at least one diversity cluster is configured to reduce an effect of inter-cell interference (col. 4, lines 11-25).

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify the combination of Baum and Heath, Jr. to include wherein the at least one diversity cluster is configured to reduce an effect of inter-cell interference for the purpose of improving system capacity.

Allowable Subject Matter

6. Claims 1-10 and 48-50 allowed.

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joy K Contee whose telephone number is 571.272.7906. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on 571.272.7905. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JOY K. CONTEE
PATENT EXAMINER

JC

5/16/05


CHARLES APPIAH
PRIMARY EXAMINER